

MAP4C – Feb 2015

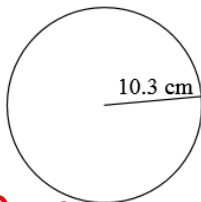
NAME: _____

Unit 1 Test – Trig and Geo

Expectation	Level Achieved
TG1 - solve problems involving measurement and geometry and arising from real-world applications	
TG3 - solve problems using primary trigonometric ratios of acute and obtuse angles, the sine law, and the cosine law, including problems arising from real-world applications, and describe applications of trigonometry in various occupations	

Expectation TG1

- 1.) Determine both of the perimeter/circumference and area of the following figures accurate to one decimal place.



$$C = 2\pi r$$

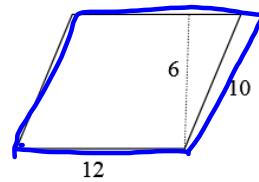
$$= 2\pi(10.3)$$

$$= 64 \text{ cm}$$

$$A = \pi r^2$$

$$= \pi(10.3)^2$$

$$= 333.4 \text{ cm}^2$$



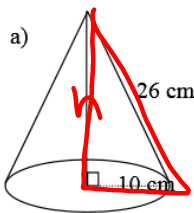
$$P = 12 + 12 + 10 + 10$$

$$= 44$$

$$A = bh$$

$$= 6(12) = 72$$

2. Find the volume and surface area of each solid accurate to two decimal places.



$$SA = \pi r^2 + \pi r s$$

$$= \pi(10)^2 + \pi(10)(26)$$

$$= 1130 \text{ cm}^2$$

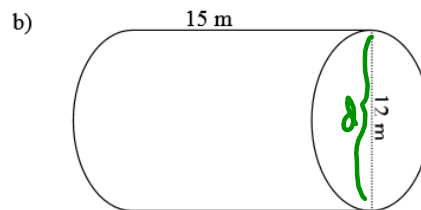
$$V = \frac{\pi r^2 h}{3} \leftarrow \text{need } h!$$

$$26^2 - 10^2 = h^2$$

$$24 = h$$

$$V = \frac{\pi(10)^2(24)}{3}$$

$$= 2512 \text{ cm}^3$$



$$SA = 2\pi r^2 + 2\pi r h$$

$$= 2\pi(6)^2 + 2\pi(6)(15)$$

$$= 791.3 \text{ m}^2$$

$$V = \pi r^2 h$$

$$= \pi(6)^2(15)$$

$$= 1695 \text{ m}^3$$

3. A basketball has a diameter of 50 cm. If the material that covers the ball is \$20 per square meter, find the cost to make 30 balls. Show all your work, round to the nearest hundredth. (2 decimals)

$$r = 25 \text{ cm} \\ = 0.25 \text{ m}$$

$$SA = 4\pi r^2 \\ = 4\pi(0.25)^2 \\ = 0.78 \text{ m}^2$$

Cost for 1 ball:

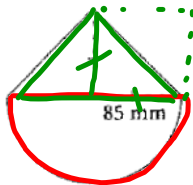
$$20 \times 0.78 \\ 15.6$$

Cost for 30 balls:

$$15.6 \times 30 \\ \$468$$

4. Determine the area of the following figures.

a)



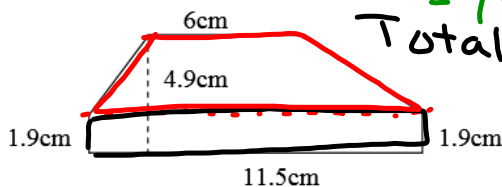
$$A_{\circ} = \frac{\pi r^2}{2} \\ = \frac{\pi (85)^2}{2} \\ = 11349 \text{ mm}^2$$

$$A_{\Delta} = \frac{bh}{2} \\ = \frac{(85 \times 2)(85)}{2} \\ = (85)(85) \\ = 7225 \text{ mm}^2$$



$$A_{\Delta} = \frac{bh}{2} \\ = \frac{(170)(85)}{2}$$

b)



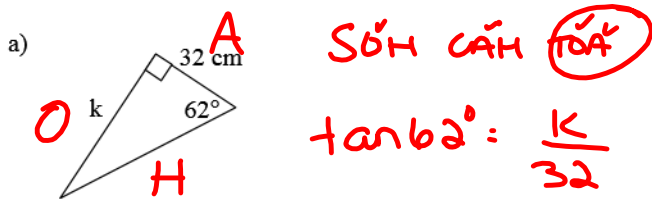
$$\text{Total: } 11349 + 7225 \\ = 18574 \text{ mm}^2$$

5. A coffee cup has a height of 17cm. Determine the maximum volume in litres that a coffee cup with this height can have in order to minimize the surface area.

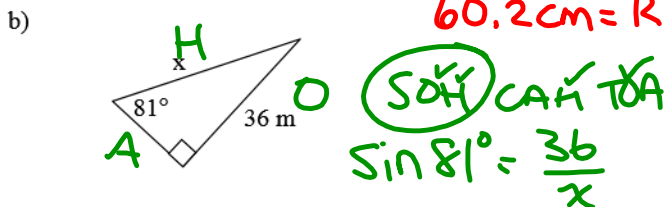


Expectation TG3

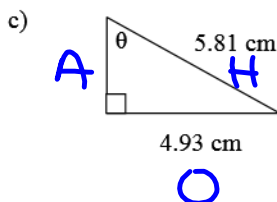
Use your knowledge of SOH CAH TOA to find the value of the given variable to 1 decimal place.



$32 \tan 62^\circ = k$
 $60.2 \text{ cm} = k$

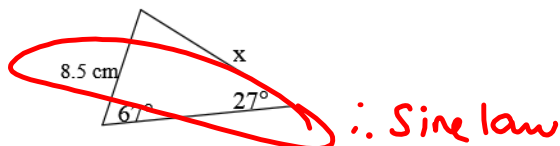


$x = \frac{36}{\sin 81^\circ}$
 $x = 36.4 \text{ m}$



$\sin \theta = \frac{4.93}{5.81}$
 $\theta = 58^\circ$
 $\theta = \sin^{-1}\left(\frac{4.93}{5.81}\right)$

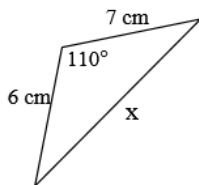
7. Use the Sine Law to find the value of x , correct to 1 decimal place.



$\frac{x}{\sin 67^\circ} = \frac{8.5}{\sin 27^\circ}$

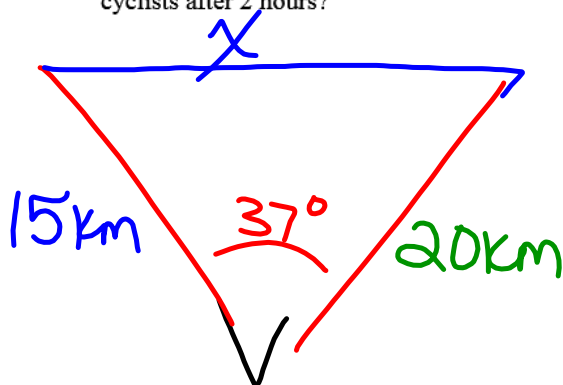
$x = \frac{8.5 \sin 67^\circ}{\sin 27^\circ}$
 $= 17.2$

8. Use the Cosine Law to find the value of x , correct to 1 decimal place.



$$x = 10.6 \text{ cm}$$

9. Two roads separate from a village at an angle of 37° . Two cyclists leave the village at the same time. One travels 7.5 km/h on one road and the other travels 10.0 km/h on the other road. How far apart are the cyclists after 2 hours?



$$x^2 = 15^2 + 20^2 - 2(15)(20)\cos 37^\circ$$

$$\sin \theta = 0.6$$

$$\theta = 37^\circ \text{ OR } 143^\circ (180 - 37)$$